4 Computer Graphics and Image Processing (PR)

(a) Describe how transform coding can be used to compress image data. [4 marks]

(b) Explain the Walsh-Hadamard transform on a one-dimensional array of 4 greyscale values. [4 marks]

(c) Extend this to the Walsh transform for a two-dimensional array of $2 \times 2$ greyscale values. [4 marks]

(d) Develop an analogous transform for a three-dimensional array of $2 \times 2 \times 2$ greyscale values. [8 marks]

Include sufficient algebra in your answers to allow a competent programmer to implement the algorithm.